Mevlana Tıp Bilimleri Dergisi
Mevlana Medical Sciences
eISSN:2757-976X

ARAŞTIRMA MAKALESİ/RESEARCH ARTICLE

DOI:http:/dx.doi.org/10.56752/Mevmedsci.2026.111
Mev Med Sci, 2026; 6(2): 76-81

Comparison of Pain, Exercise Beliefs, Body Awareness, and Pain Beliefs in Patients with Cervical Disc Herniation and Lumbar Disc Herniation

Servikal Disk Hernisi ve Lumbal Disk Hernisi Olan Hastalarda Ağrı, Egzersiz İnanışı, Vücut Farkındalığı ve Ağrı İnançlarının Karşılaştırılması

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Makale Tarihleri/Article Dates:
Geliş Tarihi/Received: 30 December 2025
Kabul Tarihi/Accepted: 13 April 2026
Yayın Tarihi/Published Online: 4 August 2026

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Açıklama/Disclosure: Yazarların hiçbiri, bu makalede bahsedilen herhangi bir ürün, aygıt veya ilaç ile ilgili maddi çıkar ilişkisine sahip değildir. Araştırma, herhangi bir dış organizasyon tarafından desteklenmedi. Yazarlar çalışmanın birincil verilerine tam erişim izni vermek ve derginin talep ettiği takdirde verileri incelemesine izin vermeyi kabul etmektedirler.

ÖZET

Amaç: Bu çalışmanın amacı servikal ve lumbal disk hernisi tanılı hastaların ağrı düzeyi, ağrı inançları, vücut farkındalığı ve egzersiz inanışları açısından karşılaştırmaktı.
Yöntem: Çalışmaya 20-65 yaş aralığında sadece servikal disk hernisi olan (Grup I, n=59) ve sadece lumbal disk hernisi tanısı alan (Grup II, n=60) hastalar alındı. Katılımcıların ağrı şiddeti Görsel Analog Skala (GVAS), ağrıya yönelik inançların belirlenmesi için Ağrı İnançları Ölçeği (AİÖ), vücut farkındalığının belirlenmesi için Vücut Farkındalığı Anketi (VFA) ve egzersize yönelik inanışların belirlenmesi için de Egzersiz İnanışları Anketi (EİA) kullanıldı.
Bulgular: Grupların GAS, AİÖ, VFA ve EİA skorları arasında istatistiksel olarak farklılık görülmedi ($p>0.05$).
Sonuç: Bu sonuçlar servikal veya lumbal disk hernisinde ağrı şiddeti, ağrı inanç düzeyi, vücut farkındalığı ve egzersiz inanışlarının benzer olması durumun anatomik bölgedeki farklılığından çok etkilediği fizyolojik ve psikolojik mekanizmalarla ilişkili olduğunu gösterebilir.

Anahtar Kelimeler: Egzersiz, ağrı, disk hernisi, inanç

ABSTRACT

Aim: This study compared patients diagnosed with cervical and lumbar disc herniation in terms of pain level, pain beliefs, body awareness, and exercise beliefs.
Methods: Patients aged 20-65 years with only cervical disc herniation (Group I, n=59) and only lumbar disc herniation (Group II, n=60) were included in the study. Pain intensity was assessed by Visual Analog Scale (VAS), pain beliefs were assessed using the Pain Beliefs Scale (PAS), body awareness was assessed using the Body Awareness Questionnaire (BAQ), and exercise beliefs were assessed using the Exercise Beliefs Questionnaire (EBQ).
Results: No statistically significant differences were found between the groups in VAS, EBQ, BAQ and PAS scores ($p>0.05$).
Conclusion: These results suggest that the similarity in pain intensity, pain belief levels, body awareness, and exercise beliefs in cervical or lumbar disc herniation is related to the physiological and psychological mechanisms affecting the condition rather than differences in anatomical location.
Key words:

Key words: Exercise, pain, disc herniation, belief.

Atıf yapmak için/ Cite this article as: Dogan H, Ozkan Y. Comparison of Pain, Exercise Beliefs, Body Awareness, and Pain Beliefs in Patients with Cervical Disc Herniation and Lumbar Disc Herniation. Mev Med Sci. 2026; 6(2): 76-81

INTRODUCTION

Cervical and lumbar pain are significant health problems with a high prevalence in society (1). Exercise is a frequently used treatment approach in the management of these pains (2,3). Exercises aimed at improving body awareness have been shown to reduce pain levels, while pain perception and beliefs about exercise have been shown to influence individuals' physical activity behaviors (4,5). Beliefs about pain are considered a fundamental component of the pain experience because they influence coping strategies, pain intensity, and physical functioning (6,7). In chronic low back pain, in particular, false beliefs that pain is due to tissue damage increase the risk of disability by increasing fear-avoidance behaviors (8).

Pain awareness is a cognitive process that refers to an individual's perception, interpretation, and level of attention to pain. Recent studies have shown that individuals experiencing chronic pain sometimes have increased awareness of bodily sensations, suggesting that pain awareness processes play a significant role in pain perception and regulation (9,10). When beliefs about exercise are examined, it is reported that various barriers, such as time constraints, cost, and lack of motivation, persist even in highly educated individuals (2,8). Furthermore, it has been shown that body awareness decreases in people with chronic neck and lumbarl pain, and that adding body awareness-based therapies to rehabilitation processes can reduce pain and disability (4, 11).

This evidence demonstrates that pain, pain beliefs, body awareness, and exercise beliefs are interrelated concepts. However, the literature lacks studies that have examined these variables collectively. Therefore, our study aimed to compare the pain level, pain beliefs, body awareness, and exercise beliefs of patients diagnosed with cervical and lumbar disc herniation.

MATERIALS AND METHODS

Research Design

This descriptive study included 119 volunteer patients aged 20-65 years who were diagnosed with either only cervical or only lumbar disc herniation. Fifty-nine patients had only cervical disc herniation (Group I), and 60 patients had only lumbar disc herniation (Group II). The study was conducted in a secondary healthcare institution. The study was approved by Health Sciences Ethics Committee of Necmettin Erbakan University (Decision number: 2023/455). The study adhered to the Declaration of Helsinki, and written informed consent was obtained from the patients. All patient data were obtained through face-to-face interviews.

Inclusion criteria were;: age between 20-65 years, diagnosed with lumbar disc herniation or cervical disc herniation (After the MRI images were reviewed by a physical therapy specialist, the results for patients referred to physiotherapy were indicated on their treatment charts), literate and Turkish-speaking, and experiencing back pain or neck pain lasting longer than 3 months. Patients with communication difficulties, a history of malignancy, pregnancy, or vertebral column or lower extremity surgery were excluded from the study. Sociodemographic data, including patient gender, age, diagnosis, education level, occupation, height, and body weight, were initially recorded. Pain severity was assessed through the use of the Visual Analog Scale (VAS), the Pain Beliefs Scale (PBS) to assess pain beliefs, the Body Awareness Questionnaire (BAQ) to assess body awareness, and the Exercise Beliefs Questionnaire (EBQ) to assess exercise beliefs.

Data Collection

Assessment Methods

The socio-demographic data form included questions regarding participants' age (years), height (m), body weight (kg), gender (female/male), diagnosis (cervical/lumbar), education level (primary/high school/university), use of medical or herbal medications, and previous surgeries. Participants' Body Mass Index (BMI) was calculated using the formula weight/height2.

Pain Level: The presence and severity of pain were assessed using the Visual Analog Scale (VAS). The VAS is frequently used to determine pain intensity and was developed by Freyd. It consists of a 10-cm straight line. The patient was asked to indicate the most appropriate location for the pain they had felt over the past month, from 0 (no pain at all) to 10 (most severe pain) (12).

Body Awareness Level: Participants' body awareness levels were assessed using the Body Awareness Scale (BAS), developed by Shields et al. in 1989 (13). The scale consists of four subgroups and a total of 18 statements and is used to determine body awareness. Participants are asked to score each statement between 1 (Not true for me at all) and 7 (Very true for me). High scores indicate high body awareness. The Turkish validity and reliability study was conducted by Karaca in 2017 (14).

Pain Beliefs: The Pain Beliefs Scale (PBS) was used to determine patients' pain beliefs. This scale was developed by Edwards et al. in 1992 (15). The scale consists of two subheadings: "organic beliefs" and "psychological beliefs." The scale contains eight items to describe organic beliefs and four items to describe psychological beliefs. Patients are asked to score each item between 1 (never) and 6 (always). Increasing scores on the subheadings of the scale indicate strong beliefs related to that topic, while decreasing scores indicate weak beliefs related to that topic. It has validity and reliability in Turkish and was developed by Berk in 2006 (16).

Exercise Belief Levels: The Exercise Belief Questionnaire

(EBQ) was used to assess beliefs about the advantages and disadvantages of exercise. Developed by Doymaz in 2013, the questionnaire consists of 33 questions under three subheadings (advantages, affected individuals, and disadvantages). Patients are asked to score the items between 1 (strongly disagree) and 6 (strongly agree). Higher scores indicate positive beliefs about exercise (17).

Statistical Analysis

G-Power (Version 3.1.7, Franz Faul, University of Kiel, Germany) was used to calculate the sample size of our study. A total of 118 participants (59 for each group) were included, based on the reference article, with an effect size of d = 0.5 and a power of 85% (18). Descriptive analyses were conducted on sociodemographic variables and scale scores. Data analyses were performed using IBM SPSS Statistics version 21 (IBM Corp., Armonk, NY, USA). Data were analyzed for normal distribution using a histogram and the Kolmogorov–Smirnov test. Continuous variables in the data were expressed as minimum and maximum values, and categorical variables were expressed as numbers and percentages. The chi-square test was employed to analyze categorical variables. In the comparison of independent groups, normally distributed data were analyzed using the Independent Samples t-test, while the Mann–Whitney U test was applied when normality assumptions were not met. In all analyses, p value of <0.05 was considered statistically significant.

RESULTS

The study was completed with patients with cervical disc herniation (n=59) and lumbar disc herniation (n=60). The sociodemographic information of the groups is given in Table 1. There was no statistically significant difference between the sociodemographic information of the patients (age, gender, BMI, education level scores (p>0.05) (Table 1). The patients' pain intensity (VAS), body awareness level (BAQ), pain belief score (PBS) and exercise belief level (EBQ) are given in Table 2. No statistically significant difference was found between the VAS, BAQ, PBS and EBQ scores of the patients with cervical disc herniation (p<0.05).

Table 1. Comparison of sociodemographic characteristics of groups

		Group I (cervical disc hernia group, n=59)	Group (lumbar disc hernia group, n=60)	p
Age (y)		40.9$\bar{x}$12.2	43.9$\bar{x}$10.6	0.16 (t=1.416)
BMI (kg/m^2)		28.2 $\bar{x}$3.98	28.1 $\bar{x}$ 3.98	0.93 (t=-0.08)
Gender	Female	24 (40.7%)	21 (35%)	
	Male	35 (59.3%)	39 (65%)	0.523 (χ^2=0.41)
	primary education	11 (18.6%)	12 (20%)	
Education level	High school	4 (6.8%)	11 (18.3%)	0.14 (χ^2=3.91)
	University	44 (74.6%)	37 (61.7%)	

*y=years, BMI: Body Mass Index, kg: kilogram, m :meters, t: Independent samples t-test, χ^2: Chi-square test, p< 0.05

Table 2. Comparison of groups' pain levels, body awareness levels, pain beliefs, and exercise belief levels

	Group I (cervical disc hernia group, n=59)	Group (lumbar disc hernia group, n=60)	p
VAS (cm)	5.28$\bar{x}$1.9	5.35$\bar{x}$2.3	0.87 (t=0.16)
PBS-Organic belief	3.6$\bar{x}$0.7	3.6$\bar{x}$0.6	0.69 (t=0.39)
PBS- Psychological beliefs	4.8 (1-6)	5 (2.25-6)	0.28 (z=-1.09)
BAS Total	103 (75-124)	105 (67-120)	0.59 (z=-0.55)
EBLS-Advantage	71 (49-78)	72 (51-78)	0.52 (z=-0.64)
EBLS-Disadvantage	24 (12-49)	24.5 (12-40)	0.45 (z=-0.76)

VAS: Visual Analog Scale, PBS: Pain Belief Scale, BAS: Body Awareness Scale, EBLS: Exercise Belief Levels Scale, t: Independent samples t-test, χ^2: Chi-square test,

DISCUSSION

This study found that patients diagnosed with cervical or lumbar disc herniation exhibited similarities in terms of pain levels, pain-related beliefs, body awareness, and exercise beliefs. To our knowledge, this is the first study to compare pain intensity, the impact of pain on physiological and psychological beliefs, and exercise beliefs in disc herniations in different regions. Our study is unique in that it compares the severity of pain in disc herniations of different locations, the impact of pain on physiological and psychological beliefs, and perspectives on exercise beliefs. In our study, the pain intensities of patients with cervical and lumbar disc herniation were moderate, and no significant difference was found between the two groups. This finding is consistent with

the literature suggesting that, although the spinal segment of the disc herniation differs, pain intensity depends not only on anatomical location but also on pathophysiological processes such as mechanical compression, inflammation, and central sensitization. Specifically, one study has shown that in this patient group, patients' tendency to catastrophize pain and central sensitization are stronger predictors of pain intensity than objective MRI findings or inflammatory markers (19). Therefore, despite the presence of herniations at different spinal levels, the similarity and moderate severity of pain perception is more relevant.Therefore, despite the presence of hernias at different spinal levels, a similar, moderate level of pain perception is a clinically expected result. This supports the possibility that pain perception and intensity may be independent of the segment level (20). Previous studies have demonstrated that both the organic beliefs and psychological beliefs subscales are related to pain perception, functional status, and quality of life in individuals with chronic pain (e.g., organic beliefs are related to disability/depression, and psychological beliefs are related to coping skills and well-being) (21). The similarity of pain beliefs in both groups supports previous studies demonstrating that pain beliefs depend not only on the location of pathology but also on the individual's pain history, health literacy, cultural factors, and psychosocial status. Systematic reviews suggest that pain beliefs are related to chronic pain experience and treatment decisions; therefore, local anatomical differences alone may not be a determining factor. The fact that both groups had similar educational levels in our study may contribute to the similar results regarding pain beliefs. Therefore, similar pain beliefs can be expected to be observed in the cervical and lumbar groups (22).

Body awareness refers to the integration of mental processes such as attention, interpretation, evaluation, beliefs, memories, conditioning, attitudes, and behaviors with proprioceptive and interoceptive awareness at a conscious level (23). The fact that body awareness levels were found to be similar in individuals diagnosed with cervical and lumbar disc herniation in our study indicates that, despite spinal segment differences, impairments in the sensorimotor system can occur commonly in both regions. Studies published in recent years report impairments in cervical proprioception and posture control in chronic cervical pathologies. These impairments are closely related to pain severity and postural stability (24). Similarly, alterations in lumbar proprioception, position sense, and balance strategies have been reported in lumbar disc pathologies; this reveals that deviations specific to sensorimotor control are common in individuals with low back pain (25). This evidence supports the biomechanical and neurophysiological basis of our finding. In other words, both cervical and lumbar disc herniation can affect body awareness similarly through peripheral receptor stimulation, adaptations in musculoskeletal control, and central sensitization mechanisms (26). This suggests that chronic pain and pain-related movement protection behaviors are not dependent on the location of the pain and therefore may have similar effects on both neck and low back pain. Evidence from the literature suggests that core stability, hydrotherapy, and multimodal exercise approaches are associated with reduced pain, greater functional capacity, and improved quality of life in patients diagnosed with lumbar disc herniation (27,28). Similarly, studies conducted on patients with cervical disc herniation demonstrate that neck muscle strengthening, posture training, and home-based exercise programs provide significant improvements in pain, range of motion, and activities of daily living (29,30). Our study found that individuals with cervical and lumbar disc herniation had similar beliefs about exercise, with high beliefs about its advantages and low beliefs about its disadvantages. This demonstrates that patients recognize the positive effects of exercise on pain, functionality, posture, and quality of life in both cervical and lumbar disc herniations. The patients' high belief in exercise supports its effectiveness as a safe and effective treatment strategy for both spinal regions.

The single-center nature of the study limits the ability to establish causality. Another limitation of the study is the absence of a control group consisting of healthy individuals. Furthermore, it is limited by the fact that assessments such as exercise levels and body awareness were not assessed with more objective tools. One of the strengths of our study is that it is the first to compare patients diagnosed solely with cervical disc herniation with those diagnosed solely with lumbar disc herniation (i.e., individuals with different anatomical regions and similar mechanical impairments) in terms of exercise beliefs, pain beliefs, and body awareness. The similarity in pain perception, pain beliefs, body awareness, and exercise beliefs in patients with cervical and lumbar disc herniation may highlight the importance of common psychosocial interventions (pain education, movement safety education, exercise adaptation strategies, cognitive behavioral approaches) for both groups in treatment planning. In addition to anatomical diagnosis, Rrehabilitation teams should assess patients' pain beliefs, fear of movement, and body awareness levels and individualize interventions to target these areas. Furthermore, clinical education and communication can play a key role in reducing negative beliefs about exercise.

CONCLUSIONS

This study demonstrates significant similarities in the pain, body awareness, and exercise belief profiles of individuals with cervical and lumbar disc herniation, supporting the need for holistic, biopsychosocially focused strategies in rehabilitation

approaches, independent of location. Future studies should examine the body awareness, pain beliefs, pain intensity, exercise quality, and psychosocial impacts of individuals with cervical and lumbar disc herniation using more objective-based measurements. Furthermore, prospective and intervention studies will illuminate the impact of these similarities on treatment response and the most effective intervention combinations.

Ethics Committee Approval: The study Necmettin Erbakan University was approved by Sağlık Bilimleri Ethics Committee. (Decision No: 2023/455). All participants provided informed consent before enrollment in the study.

Conflict of interest: The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Financial conflict of interest: Authors declares that he did not receive any financial support in this study.

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